

reason that these furnaces must be so constructed as to prevent the least possibility of free air getting in on the hearth.

These are chamber furnaces, and the height from the hearth to the roof may be great. The best furnaces are constructed with a high arch; the space immediately below it serves as a combustion chamber, and is very effective in promoting an intimate mixture of the combustible gases and the air; the combustion of the gas, therefore, takes place with very nearly the theoretical air supply.

These furnaces are operated with the doors constantly or very frequently opened. Therefore the height of the charging opening is the most important dimension and fixes the working quality of the furnace. This height must be less than the height h_t as indicated by Yesmann's formula.

The Sud-Kama works show an example of a plate-heating furnace upon the hearth of which there is no inflow of air and with which, accordingly, they have succeeded in solving the difficulty of utilizing the waste heat from the furnace in a boiler.

The data for its computation are as follows: the coal consumption per second for one chamber is 0 kg 023. The quantity of gas per second for theoretical combustion is

$$Q_0 = 4.01 \times 0.023 = 0 \text{ m}^3 092 \text{ per second,}$$

$$Q_{1000} = 0 \text{ m}^3 429 \text{ per second.}$$

The width of the charging opening is 0 m 85.

The height calculated for this opening (according to Yesmann) $h_t = \frac{h_i Q}{Q_0}$, is 0 m 216 and the effective value is 225 mm.

It may be seen by this that the working opening, which is closed by a door, has a height very well proportioned to the volume of the gases circulating in the heating chamber. It is for this reason that the opening of this door, which is operated by a pedal, does not cause an inrush of cold air into the furnace, as occurs in furnaces of other systems, for example, in the gas-fired furnace of the type used at the Alapayewsky works.

The following are the data for these furnaces:

the quantity of
 wood consumed per compartment or heating
 chamber per second
 is 0 kg 0185. The volume of gas per furnace at 0°, Q_0
 = 0 m³ 082;
 at 1000°, $Q_{1000} = 0$ m³ 382.

The height of the working door, computed
 according to the
 theory of the inverted weir $h_{1000} = 0$ m 164.
 Nevertheless, the
 charging opening is 400 mm in height. This
 explains why the